

# Quality Water

Program #2—on a video containing SIX PROGRAMS about safe and effective water systems

## Red Water (Iron)

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### *What causes red (or yellow) water?*

- ❑ *Mineral iron and iron bacteria*
- **Mineral iron** comes from iron-bearing soil or rock through which water percolates or groundwater flows. It is a widespread problem in much of Kansas. It may also be caused by corrosion of iron pipe.
- **Iron bacteria** is not a disease-causing bacteria. It forms iron-laden slime in the well and in plumbing systems. Look for the brownish slimy growth in the toilet tank.

### *What are some indicators of mineral iron?*

- ❑ *Water that is red or that turns red after exposure to air.*
- Water containing dissolved iron (“clear water” iron) has little or no color when it comes from the tap. After exposure to air for a few hours, dissolved iron reacts with oxygen to form tiny particles of “oxidized” iron, giving the water a yellow or reddish color.
- Red water—oxidized iron—comes from the tap with reddish or yellowish color.
- Reddish-brown stains on plumbing fixtures or laundry.
- The water softener capacity is reduced.
- Water has a metallic flavor.

NOTE—If you have dark brown or black stains on fixtures, laundry, or in water, it is probably from manganese, another common naturally occurring mineral contaminant in Kansas well water. Follow the same principles described for mineral iron to test and treat the problem.

### *What’s the first step in dealing with red water?*

- ❑ *Test for mineral iron and iron bacteria to see if one or both are present.*
- A sample to test for mineral iron may be drawn from any tap that delivers untreated water.
- Iron bacteria coat the inside surfaces of the plumbing system; for example, the interior of the toilet tank. A laboratory test can verify the presence of iron bacteria

### *What can I do about mineral iron in my water?*

- ❑ *Treatment is the solution, depending on the type and amount of mineral iron present.*
- An ion exchange water softener can remove moderate levels of dissolved iron—usually limited to 5 milligrams per liter or less. However, softeners containing zeolite media may be able to handle more iron. Be sure to compare the maximum iron levels recommended by the softener manufacturer with the amount of iron in your water *before* you purchase a unit.

NOTE—Oxidized or red iron, or levels of dissolved iron exceeding the manufacturer’s recommendations, may cause a softener to malfunction and eventually to become plugged.

- For oxidized iron, or *dissolved* iron levels exceeding softener manufacturer’s recommendations, an oxidizing filter (often called an “iron filter”) can be used ahead of the softener. Oxidizing filters contain a special media or sand which must be treated occasionally with potassium permanganate to maintain iron removal capability.
- For very high levels of dissolved or oxidized iron, chemical oxidation—using an oxidizer such as chlorine—followed by a sand filter to trap and remove the oxidized iron will give best results.
- An alternate water supply, if available, is often cheaper than treatment.

## What are some indicators of iron bacteria?

- ❑ *A reddish-brown, slimy coating in plumbing system, especially below the water line in the toilet tank.*
- Slimy growth on well screen and pump intakes that may reduce well capacity.
- Water loses lots of pressure through water softener because of slime on the media bed.
- Stains on laundry from globs of bacteria that break loose from plumbing.
- Bad smells from decaying bacteria.

## What can I do about iron bacteria in my water system?

- ❑ *Do a shock chlorination treatment.*
- Place a high concentration of chlorine bleach in well and plumbing system to kill iron bacteria. See Extension bulletin “Shock Chlorination for Disinfecting Water Systems,” MF-911, for detailed procedure.

NOTE—It’s nearly impossible to kill all of the iron bacteria in your system; they will grow back eventually. Be prepared to repeat the treatment from time to time.

- Persistent iron bacteria problems may require continuous chlorination of the well. When iron bacteria regrowth is rapid, repeated shock chlorination becomes time consuming. Continuous application of low levels of chlorine may be less work and more effective. An automatic liquid chlorine injector pump, or a dispenser that drops chlorine pellets into the well are common choices.

NOTE—Chlorine rapidly changes clear water iron into oxidized (colored) iron. You may need a filter to remove oxidized iron if continuous chlorination is used to control iron bacteria.

## How can I keep my iron removal equipment in good working order?

- ❑ *Regular maintenance is essential to keep all water treatment equipment working effectively.*
- If using a softener to remove dissolved iron, periodic application of a resin bed cleaner or brine salt with an additive can help prevent iron accumulation or fouling and eventual plugging.
- Oxidizing filters MUST be treated regularly with potassium permanganate to maintain iron removal capacity.
- Softeners, oxidizing filters, and plain sand filters MUST be backwashed regularly to keep them clean. Make sure your well and pump can supply water at the filter manufacturer’s recommended backwash rates. Inadequate backflushing can lead to plugging of the filter.

Adapted from Iowa Extension Publication written by Thomas D. Glanville

G. Morgan Powell  
Natural Resource Engineer

Michael H. Bradshaw  
Extension Specialist  
Health and Safety

### Sources of additional information

- Your local health department or county Extension office
- Your local library
- NSF International, P.O. Box 130140, Ann Arbor, MI 48113-0140 (313-769-8010)
- Water Quality Association, 4151 Naperville Rd., Lisle, IL 60532 (708-505-0160)



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